Radioactive Materials

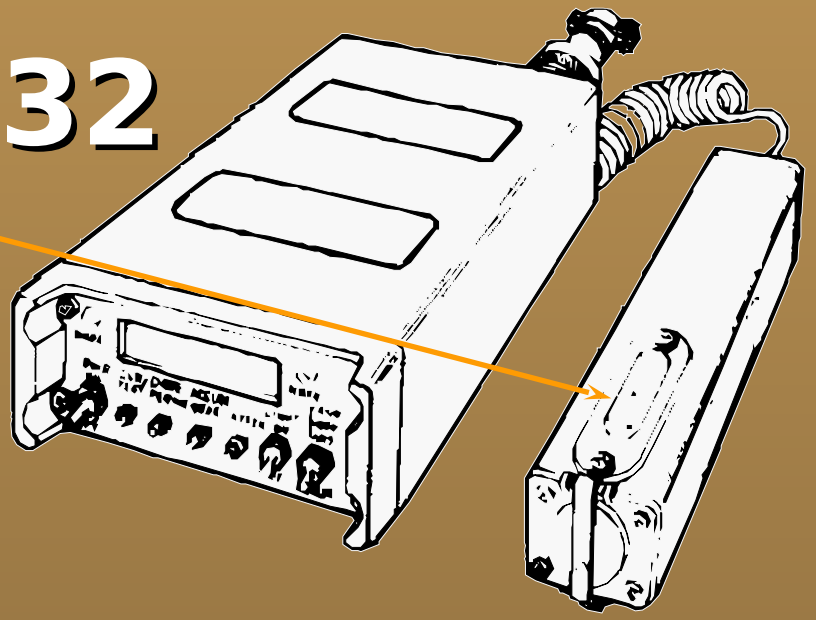
- Thorium-232
- Americium-241
- Nickel-63
- Promethium-147
- Cesium-137
- Radium-226

Thorium-232

- Abundant as Lead
- Half-Life = 14,100,000,000 yrs
- Daughter Elements have Short Half-Life
- Large amounts of Ionizing Radiation
- Alpha Particle Emitter

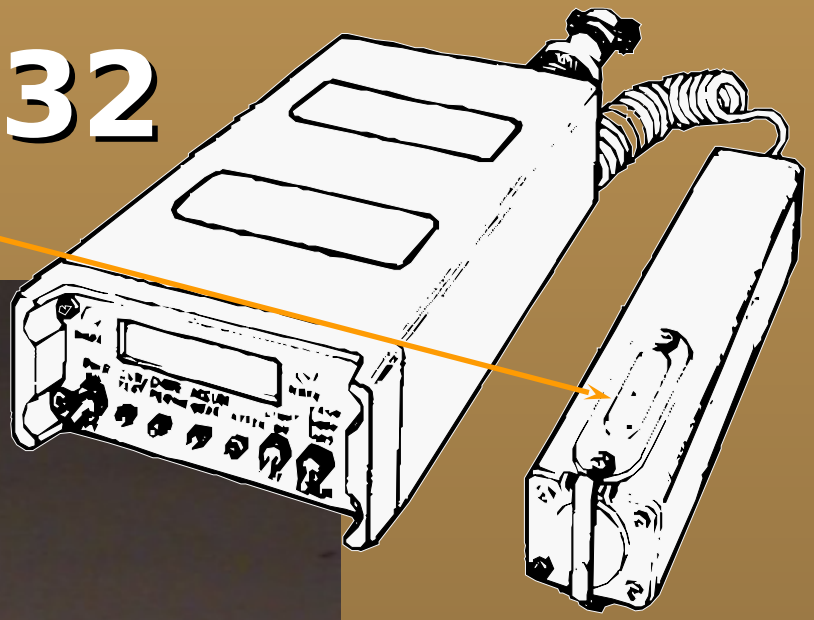
Thorium-232

- **Thorium-232**
  - **AN/VDR-2**



Thorium-232

- **Thorium-232**
  - **AN/VDR-2**



Thorium-232

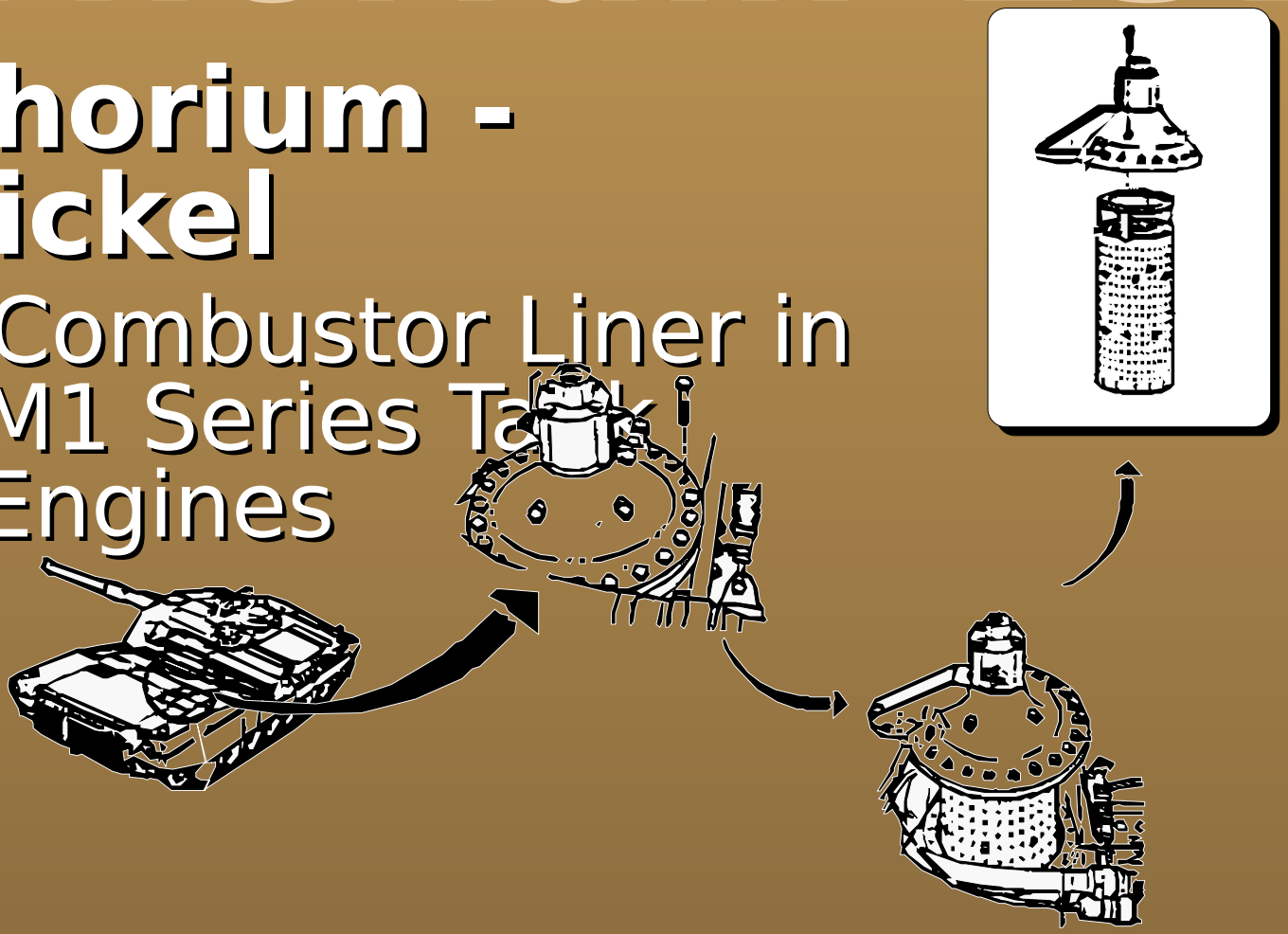
- **Check Sources**
  - **AN/PDR-54**
  - **AN/PDR-56F**
  - **AN/PDR-77**

Thorium-232

- Thorium Fluoride
- Thermal Optics

Thorium-232

- **Thorium - Nickel**
  - Combustor Liner in M1 Series Tank Engines

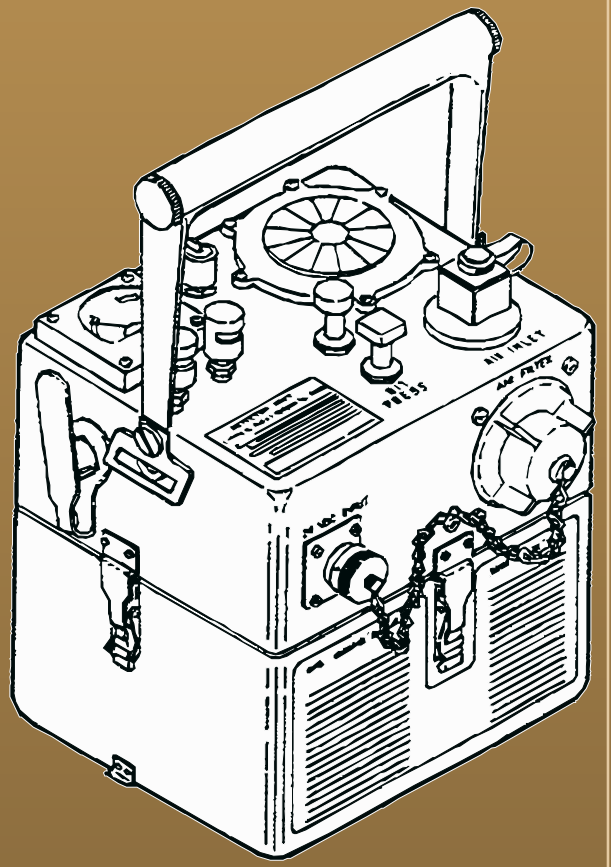


Americium-241

- Does not occur in nature
  - Daughter product of Plutonium
- Half Life = 458 yrs
- Alpha emitter
  - Some Beta & Gamma
- “Bone Seeker”

Americium-241

- **M43A1 Chemical Agent Detector**



Americium-241

- **M43A1 Chemical Agent Detector**

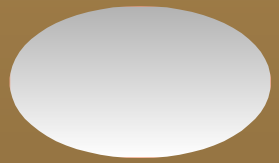
Americium oxide

Americium-241

- **M43A1 Chemical Agent Detector**

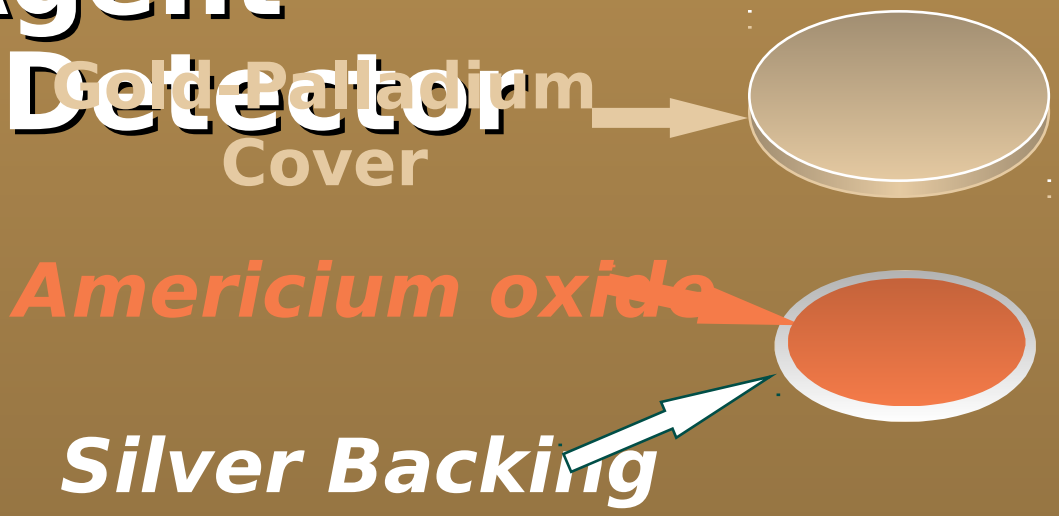
Americium oxide

Silver Backing



Americium-241

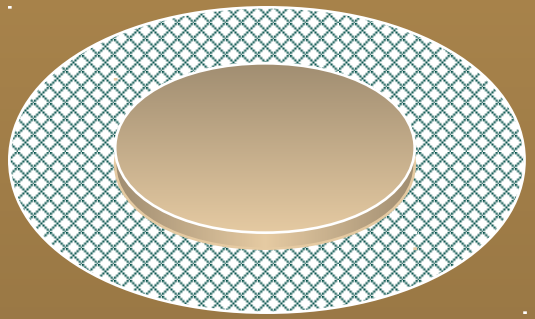
- **M43A1 Chemical Agent Detector**



Americium-241

- **M43A1 Chemical Agent Detector**

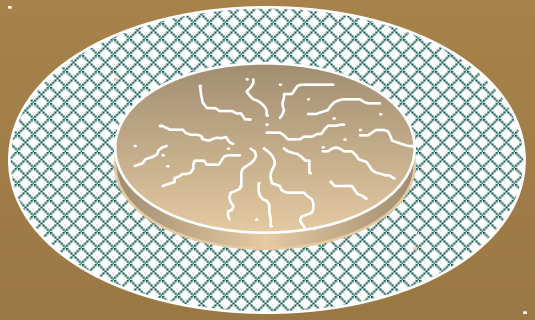
“Special Form” Source



Americium-241

- **M43A1 Chemical Agent Detector**

“Special Form” Source

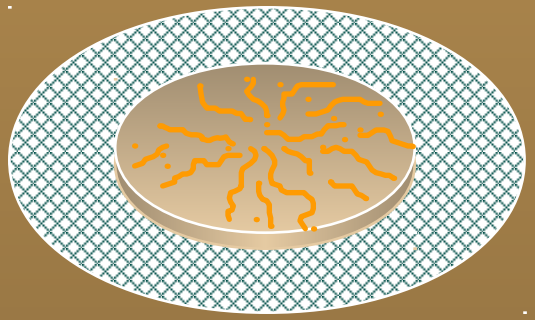


Source Deterioration

Americium-241

- **M43A1 Chemical Agent Detector**

“Special Form” Source



Americium Contamination

Americium-241

MC-1

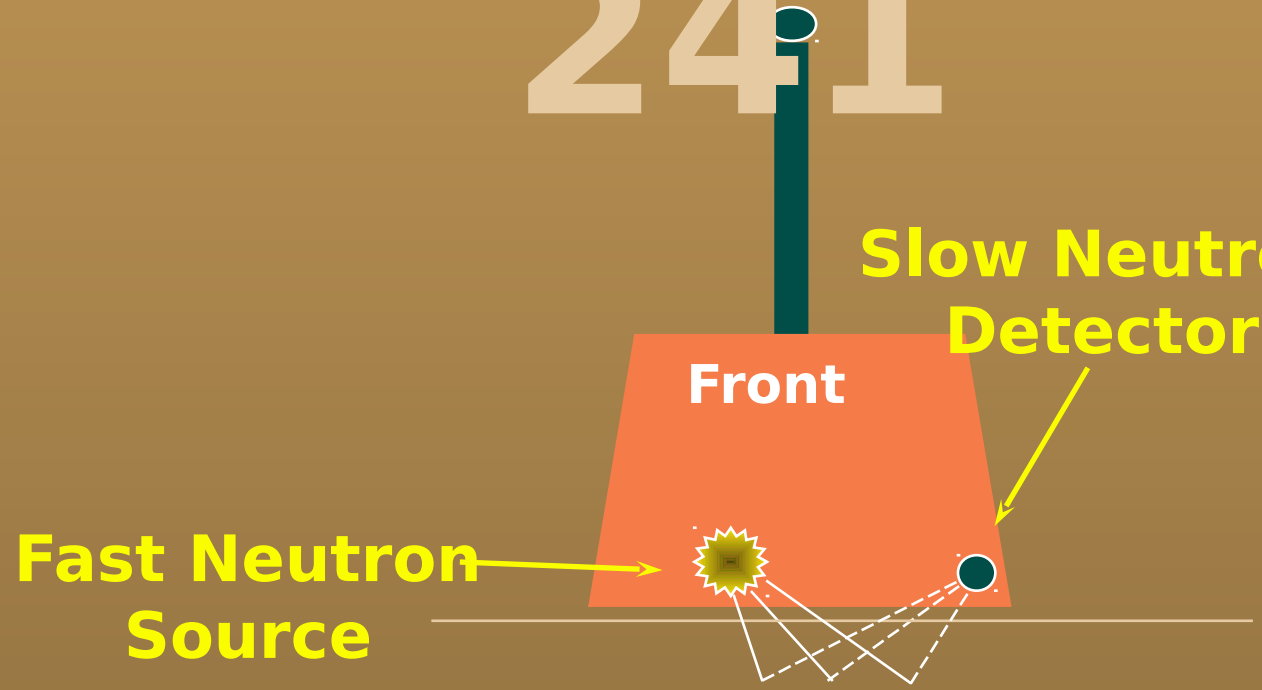
Density

&

Moisture

Tester

Americium-241



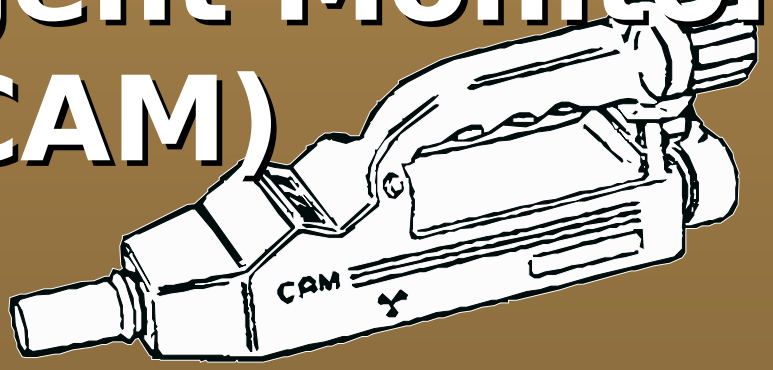
- **Density & Moisture Tester**
  Campbell Pacific Model MC-1

Nickel-63

- Half Life = 96 yrs
- Beta emitter
  - Too low to penetrate dead skin

Nickel-63

- Half Life = 96 yrs
- Beta emitter
  - Too low to penetrate dead skin
- Chemical Agent Monitor (CAM)



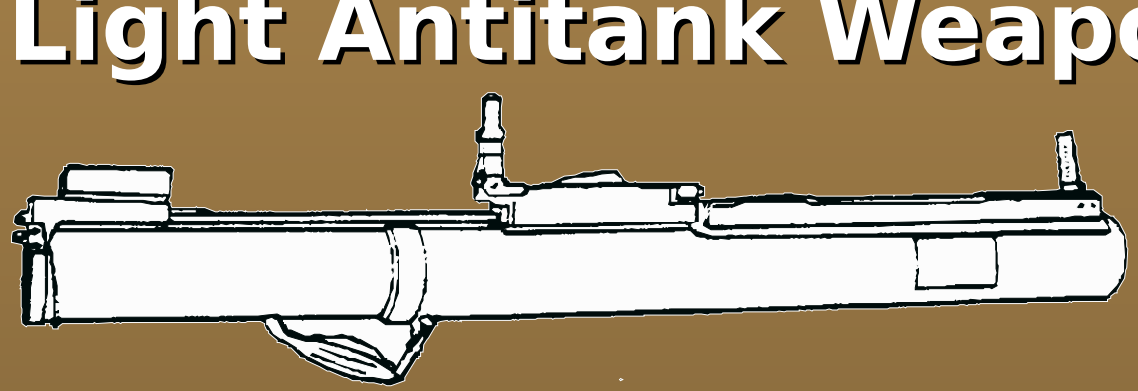
Promethium-147

- Half Life = 2.64 yrs
- Alpha & Beta particle emitter
- Used in Luminous Paint

Promethium-147

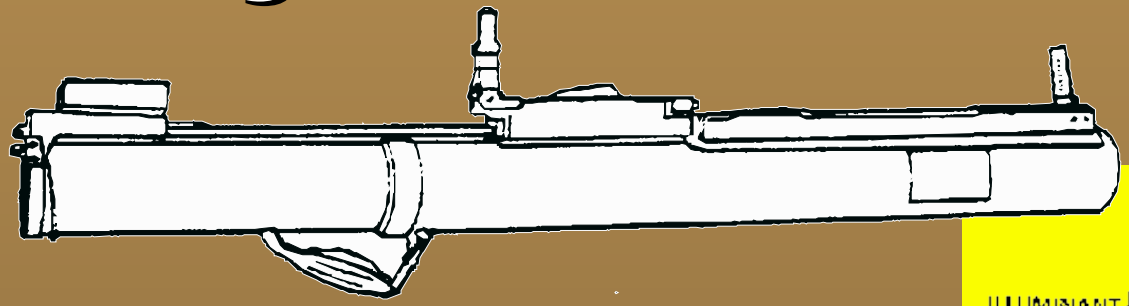
- Half Life = 2.64 yrs
- Alpha & Beta particle emitter
- Used in Luminous Paint

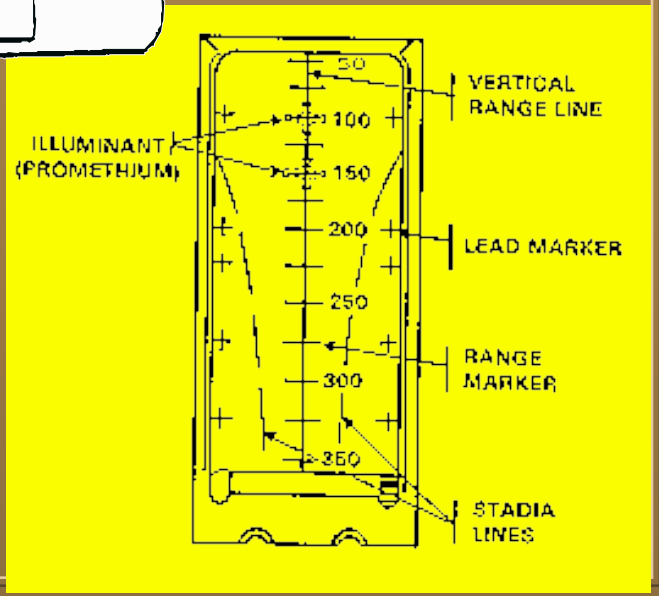
- M72 Series
  Light Antitank Weapon (LAW



Promethium-147

- M72 Series Light Antitank Weapon (LAW

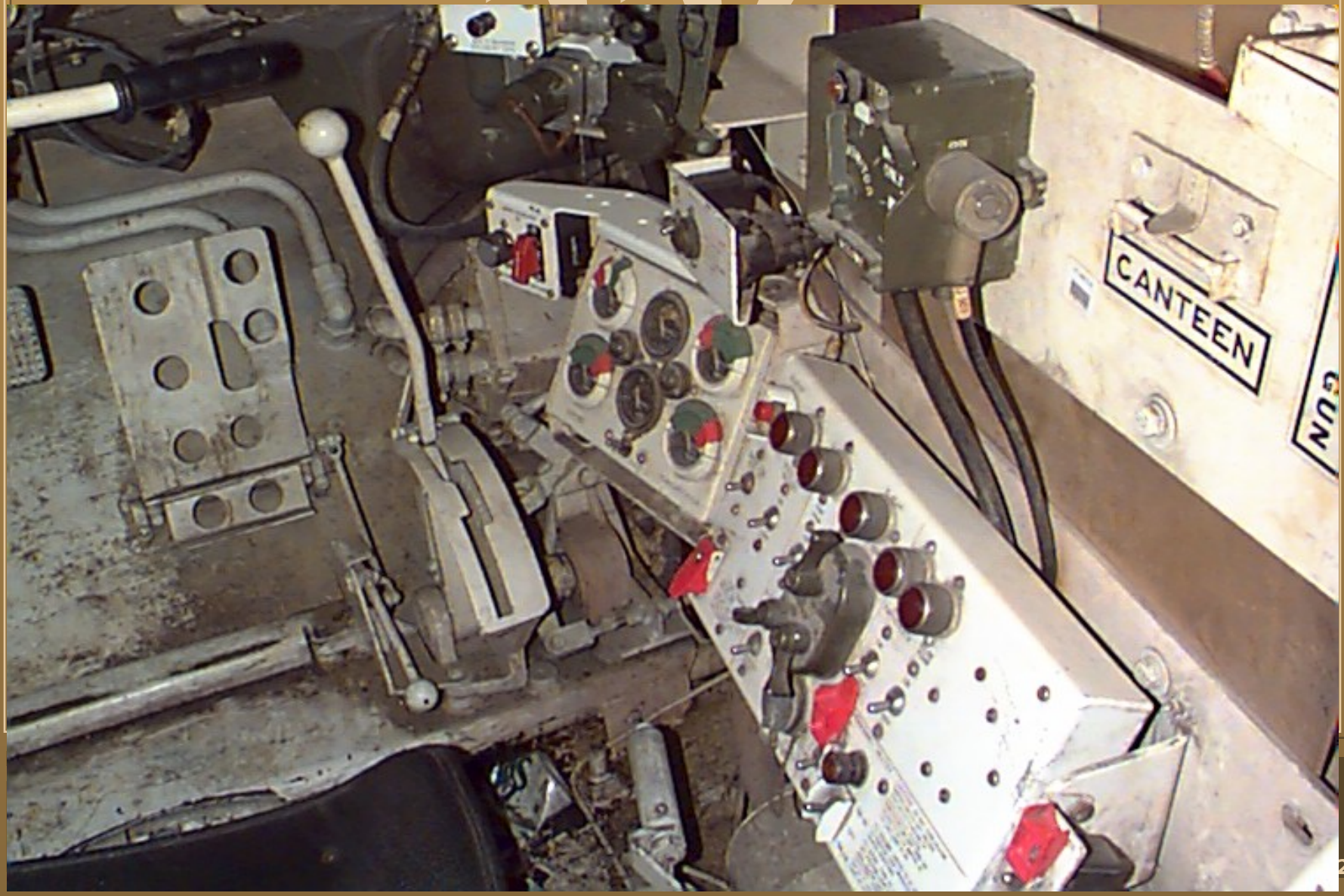




Radium-226

- **Half-Life = 1,602 yrs**
- **Alpha Emitter**
  - Some Beta and Gamma
- **Gauges & Dials**
- **DARA A21-12-04**

Radium-226

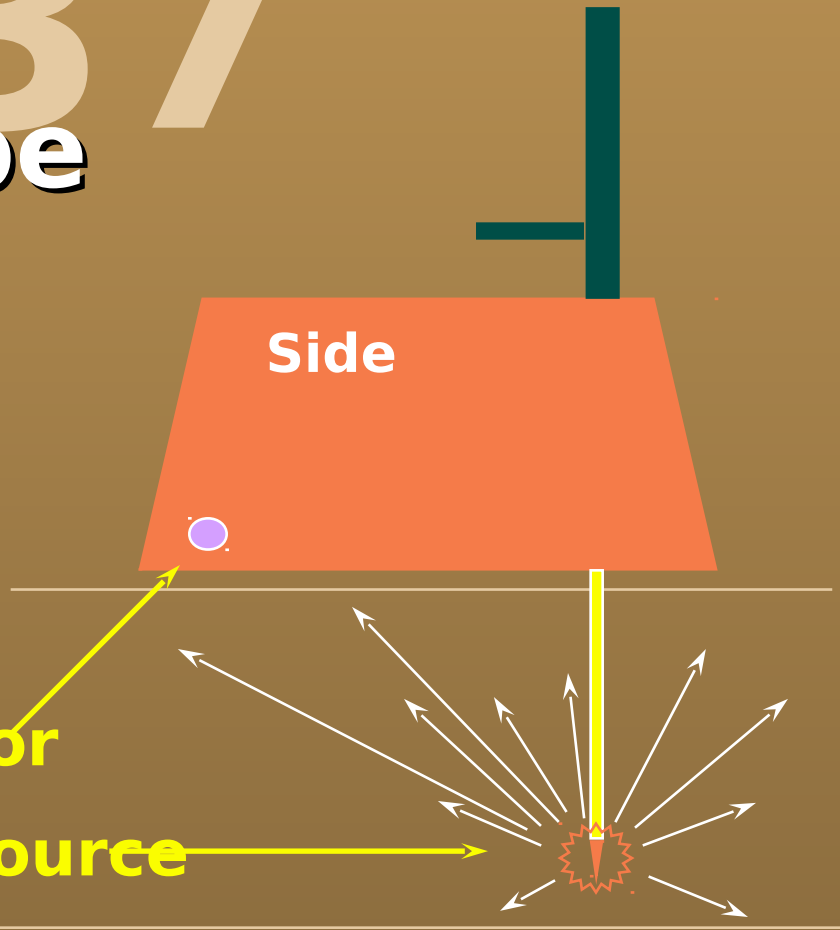


Cesium-137

- Half-life = 30 yrs
- Beta emitter
- Gamma rays from Ba137m (daughter element)
  - Some x-rays from barium daughter element

Cesium-137

- **Density Probe on MC-1**



- **Spark Igniters on M60 Vehicles**

NSN

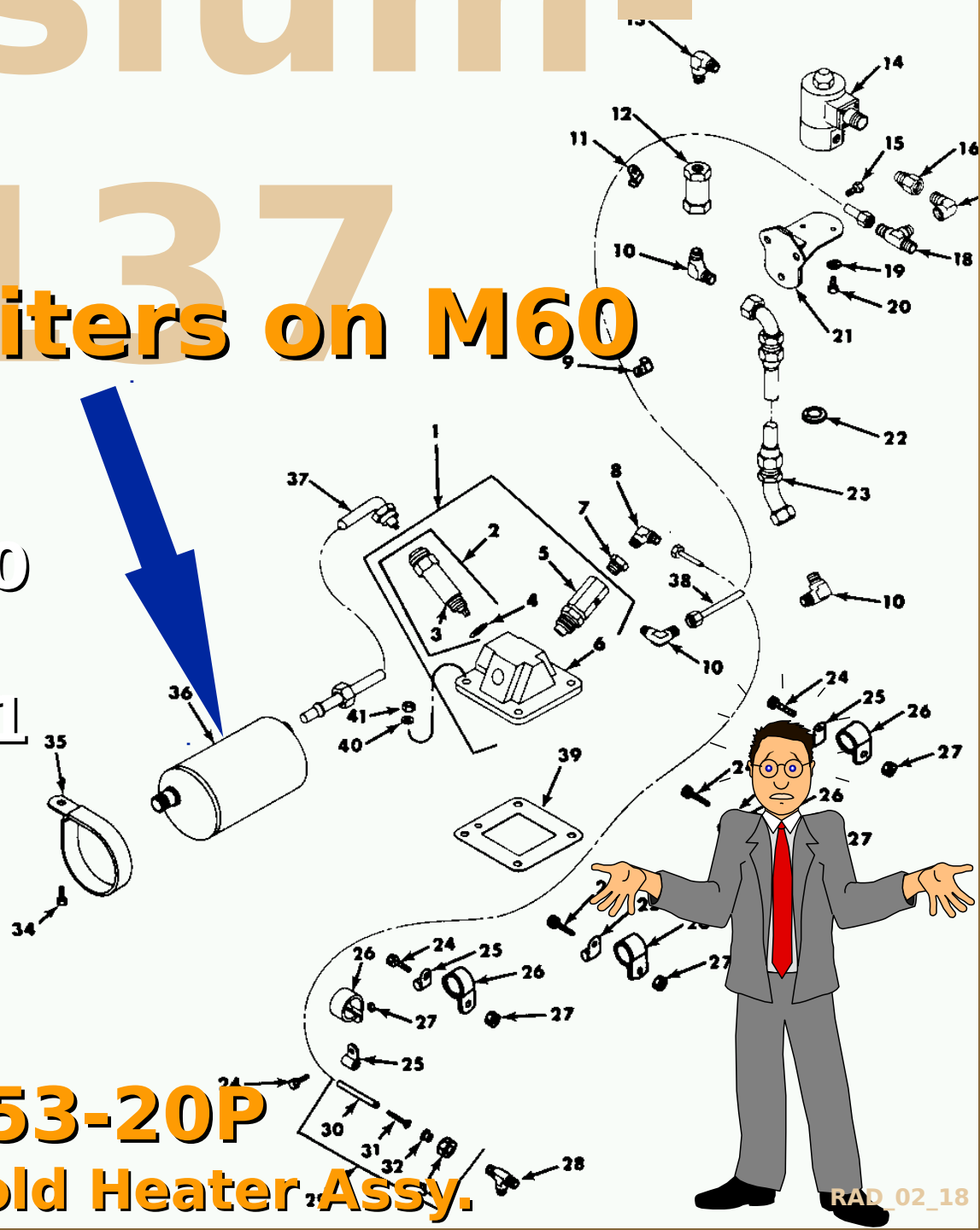
2920-00-009-9340

Replaced by:

2920-00-770-1641

SMR Code

PAOZZ



TM 9-2350-253-20P

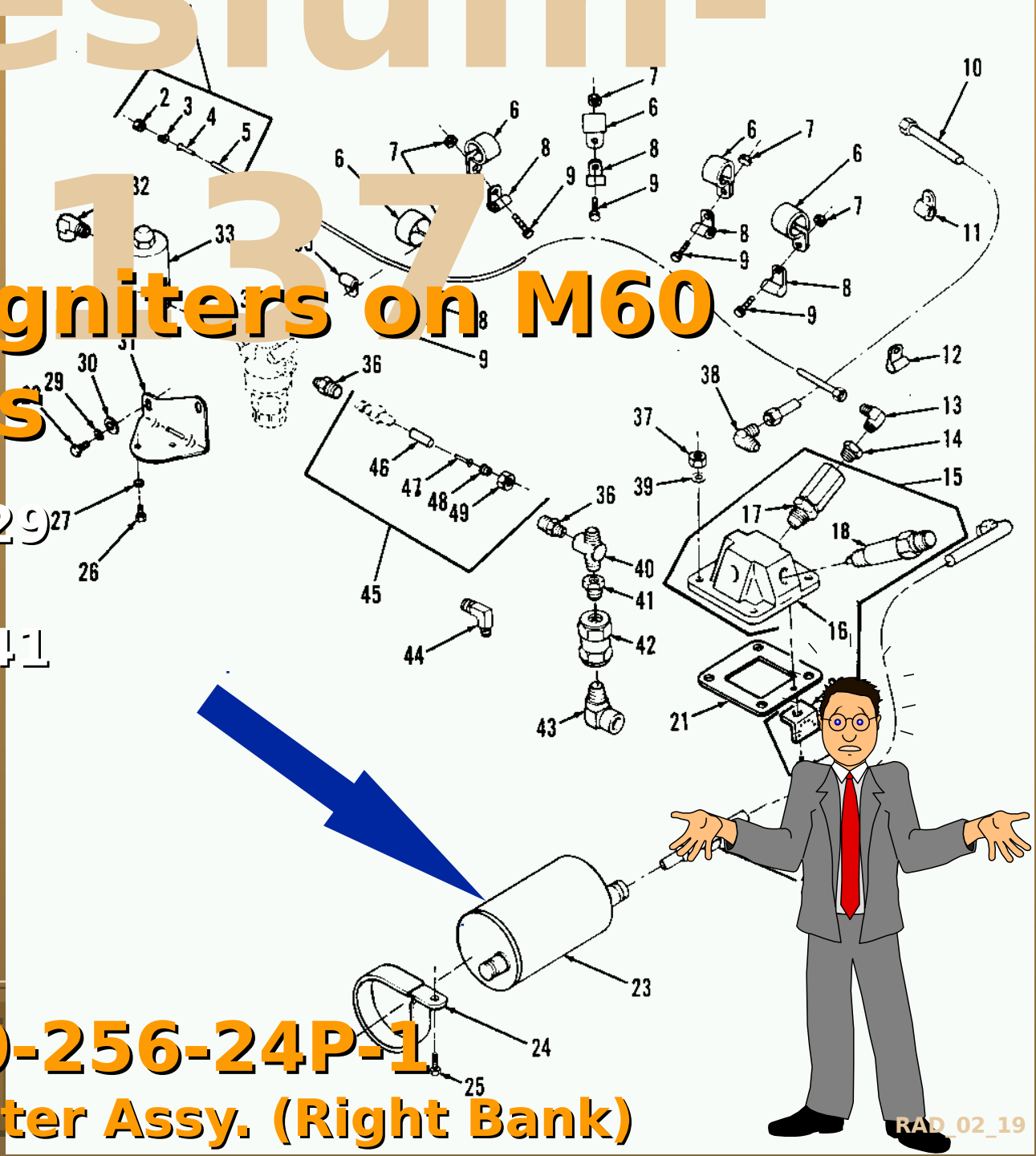
g 42. Left Bank Manifold Heater Assy.

RAD_02_18

- **Spark Igniters on M60 Vehicles**

NSN
2920-00-711-5829
Replaced by:
2920-00-770-1641

SMR Code
PAOZZ



TM 9-2350-256-24P-1

42. Manifold Heater Assy. (Right Bank)

RAD_02_19